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ABSTRACT

This study represents a segment of an evaluation of the effects of two diametrically-opposed instructional strategies on inner-city kindergarten children who had varying preschool experiences. The child- and parent-oriented "enrichment" approach was used in one school while the teacher- and goal-oriented "direct instructional" approach was practiced in a separate but comparable school. Children randomly selected from both programs were tested on a variety of measures in October and May. Data were collected on such independent variables as school poverty index (percent of families on welfare), chronological age, number of siblings, ordinal rank of child in family, and school year attendance. Two statistical measures were used: Stepdown Regression Analysis and Analysis of Covariance. Results indicated (1) direct instructional strategy was more effective than enrichment in fostering basic academic skills, (2) effect of preschool experience one year later was limited to reading scores only, and (3) pretest scores were the best predictors of children's performance on posttests of general mental functioning and basic skills. (Author/WY)

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ENRICHMENT APPROACH VERSUS DIRECT INSTRUCTIONAL APPROACH AND THEIR EFFECTS ON DIFFERENTIAL PRESCHOOL EXPERIENCES[1]

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This study represents a segment of an evaluation of the effects of two diametrically-opposed instructional strategies on kindergarten children with varying preschool experiences -- no preschool, six weeks OEO Head Start, and 38 weeks Title I Child Development. The first approach, enrichment, child - and present - centered, is primarily concerned with his personal needs and limitations. It has the philosophy that the child's interest is best served by permitting the child to go at his own pace with the teacher guiding or setting limits, rather than providing instruction. The second approach, instructional, is teacher - and goal - oriented, which prescribes to the philosophy that the child's interest is best served by explicit direction to foster intellectual growth. In addition, several unique identifiable components initiated at prekindergarten, were extended into these two programs: parent involvement, in-service workshops for teachers, addition of instructional materials and addition of a teaching assistant per classroom.

This study was undertaken to answer the following questions:

1. What variables other than kindergarten instructional program and preschool experiences exert significant influences on children's performance?

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[1] Presented at the 1970 AERA convention at Minneapolis, Minnesota.

2. Does exposure to one kind of instructional program make any real difference in the children's performance?

3. What is the sustained value of preschool experiences in special kindergarten programs?

4. What are the effects of different instructional strategies on preschool experience?

Procedure

The two instructional approaches were assigned separately to two inner-city schools comparable in poverty, population, and geographical location.

Children randomly selected from these two programs were tested in October and in May on seven WPPSI subtests (Verbal Scale: Similarities, Comprehension, Arithmetic, and Vocabulary subtests; Performance Scale: Picture Completion, Geometric Designs, and Block Designs), and on Preschool Inventory (PSI). Total scores obtained in May on the Metropolitan Reading Readiness Test and school year attendance of children were also included in the analysis. Scores obtained in May as well as the school year attendance served as dependent or criterion variables.

Other data collected on the children served as independent variables: school poverty index (percent of families on welfare), chronological age, number of siblings, ordinal rank of child in the family, and school year attendance.

Two statistical tests were used: Stepdown Regression Analysis and Analysis of Covariance.

Findings and Implications

Variables With Significant Regression on the Criterion Measure

Of the five independent variables utilized in the Stepdown Regression Analysis, pre-test mean score whenever available, showed consistent significant influence ($p < .001$). Pre-test score on the WPPSI Scales (Verbal, Performance, and Full Scale) and on the PSI were the best predictors of post-performance on these measures. Table 1 shows:

1. Approximately 25% of the variance of the full and verbal scale IQ scores could be attributed to the pre-test IQ scores.

2. Approximately 55% of the variance or twice those observed for the two other scales of the performance scale IQ score could be attributed to the pre-test IQ score. It is notable that pre-test score was the only significant predictor for a test of general mental ability such as the WPPSI.

3. Approximately 59% of the variance of the PSI mean total scores may be attributed to the pre-test score.

The degree to which a school may be considered "poor," roughly represented by the poverty index (percent of families on welfare for that school), also showed significant influences on tests of general school readiness or basic skills. Table 1 shows:

1. Addition of poverty index to pre-test score increases prediction of post-performance on PSI from 59% to 62%. Prediction could be further increased by including the school year attendance of the child, bringing it up to 69%.

2. Approximately 25% of the variance of mean total score on the Metropolitan Reading Readiness could be attributed also to poverty index. Addition of chronological age as another predictor increases attributable variance to 31%.

TABLE 1

INDEPENDENT VARIABLES SHOWING SIGNIFICANT REGRESSION ($p < .001$) ON TEST MEASURES

Test	Independent Variable	Overall F	R^2
WPPSI			
Full Scale IQ	Pre-Test IQ Score	27.17	0.25
Verbal Scale IQ	Pre-Test IQ Score	21.25	0.25
Performance Scale IQ	Pre-Test IQ Score	102.25	0.55
Preschool Inventory			
	Pre-Test Score		0.59
	Poverty Index	62.61	0.62
	School Year Attendance		0.69
Metropolitan Reading Readiness			
	Poverty Index		0.25
	Chronological Age	19.49	0.31

The relative stability of general mental functioning is evidenced also by the consistent significant regression of pre-test scores on the WPPSI scale IQ scores. Of the five independent variables, the pre-test score was the best and only significant predictor of post performance. In contrast, variables besides pre-test score, such as chronological age, poverty index, and attendance exerted significant influence on the direction of post performance on tests of basic skills. This finding suggests that growth in basic skills is influenced easily by both internal and external factors.

Directive Approach Versus Enrichment Approach

The Analysis of Covariance (Table 2) indicates that the two diametrically-exposed instructional programs showed significant effects on test performance, but their effects were limited only to acquisition of basic skills. Children exposed to the direct instructional program reported significantly higher scores. These findings were noted (refer to Tables 2 and 3):

1. An F value of 16.32 ($p<.001$) was found when test performance of the two groups on the PSI was compared at the end of the year. Children exposed to the direct instructional strategy reported an adjusted mean of 69.95, while children in the enrichment program showed an adjusted mean of 63.62. A difference of six points did not appear too strong until the pre-test scores on Table 4 were examined:

   . Pre-test mean for the children in the directive approach program is 54.97; the pre-test mean for the children in the enrichment approach program is 59.27.

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TABLE 2

SUMMARIES OF ANALYSIS OF COVARIANCE

Dependent Variable	A(df=1)		B(df=2)		AB(df=2)		Within Cell			F		
	SS	MS	SS	MS	SS	MS	SS	df	MS	A	B	AB
1. WPPSI												
Full IQ	7.63	7.63	50.61	25.30	56.70	28.35	3,445.22	81	42.53	<1	<1	<1
Verbal IQ	9.94	9.94	261.06	130.53	36.98	18.49	4,129.71	81	50.98	<1	2.56	<1
Performance IQ	90.74	90.74	120.96	60.48	189.85	94.92	6,546.35	81	80.82	1.12	<1	1.18
2. Preschool Inventory	558.32	558.32	29.31	14.65	19.87	9.94	2,839.84	83	34.22	16.32*	<1	<1
3. Metropolitan Reading Readiness	5,056.71	5,056.71	624.87	312.44	795.76	397.88	17,911.15	82	218.43	23.15*	1.43	1.82
4. School Year Attendance	531.18	531.18	520.56	260.28	222.47	111.23	14,147.46	85	166.44	3.19	1.56	<1

* $p < .001$

TABLE 3

ADJUSTED MEAN SCORE BY DEPENDENT VARIABLE
FOR FACTORS A AND B

Factor	WPPSI IQ Score			Preschool Inventory	Metropolitan Reading Readiness Score	School Year Attendance
	Full Scale	Verbal Scale	Performance Scale			
Instructional Strategy (A)						
Direct	90.90	89.84	94.17	69.95	78.22	162.75
Enrichment	94.83	95.18	94.67	63.62	45.00	167.69
Preschool Experience (B)						
No Preschool	90.98	94.99	89.38	64.50	51.82	164.90
6 Weeks (OEO Head Start)	93.15	90.62	98.28	67.52	62.70	163.75
38 Weeks (Title I Child Development)	95.65	93.53	96.87	68.53	64.96	169.23

TABLE 4

PRE-POST MEAN SCORES FOR FACTORS A AND B
BY DEPENDENT VARIABLE

Factor	WPPSI						Preschool Inventory	
	Full IQ		Verbal IQ		Performance IQ			
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Instructional Strategy (A)								
Direct	90.74	90.65	92.79	90.38	89.79	92.97	54.97	67.39
Enrichment	97.17	94.74	98.19	94.64	97.07	95.87	59.27	66.18
Preschool Experience (B)								
No Preschool	91.19	90.90	92.39	92.70	91.61	91.39	52.21	63.55
6 Weeks (OEO Head Start)	97.00	93.84	98.29	92.52	95.77	96.68	60.41	67.81
38 Weeks (Title I Child Development)	96.07	95.04	97.92	93.92	95.62	96.46	60.88	69.19

2. An F score of 23.15 ($p < .001$) was found when mean reading scores on the Metropolitan Reading Readiness were compared. The adjusted mean reading score of children in the direct approach program was 78.22; the mean reading score of children in the enrichment approach program was 45.00.

These findings indicate that direct instructional strategy is more effective than enrichment approach in fostering basic academic skills. Observed gains in these skills do not always reflect the level of general mental functioning as evidenced by an IQ score, e.g. mean reading score of 78.22 (A rating) was obtained from a group with a mean IQ score (WPPSI) of 90.90. The marked improvement in acquisition of basic skills among children exposed to the direct instructional approach confirms previous reports of Bereiter and Engleman. They had pointed out that acquisition of basic skills can be boosted independently of IQ scores and much more than IQ scores in the early years, through highly concentrated and direct teaching. Perhaps we need to refocus our emphasis on measuring scholastic or achievement gains rather than IQ gains which had been over emphasized in the past. Common sense dictates the use of test instruments which will assess skills that are related to the behavioral objectives of programs of this nature rather than intelligence test measures, which are not only expensive, and which are not only unrelated to program objectives, but yield scores generally considered stable over time.

Sustained Value of Preschool Experience
One Year Later

The effects of preschool experience one year later were limited to reading scores obtained on the Metropolitan Reading Readiness Test. An individual contrast of mean scores of 64.96 and 51.82 reported respectively by children with and without preschool experiences showed an F value of 12.09 ($p < .001$).

The summaries of Analysis of Covariance (Table 2) showed that differences between children with different preschool experiences did not approach true significance, nor were there any significant interaction effects between preschool experience and instructional strategy.

The absence of any true differences in test performance between children with different preschool experiences may be interpreted in different ways:

1. General effects of preschool programs other than reading ability disappeared at the end of kindergarten program.

2. Extension of certain components considered unique to preschool programs only to kindergarten -- teachers' in-service workshops, enlistment of parent involvement, addition of a teaching assistant, and use of more instructional materials -- has helped eliminate true differences between children with and without preschool experiences.

Is it therefore, more economical and practical to reinvest efforts at preschool to kindergarten programs? Its importance from an educational and psychological point of view in terms of eliminating possible impairment of learning sets before effective learning capacities develop cannot be denied. As Elkind, (Harlow, 1969) conjectured: The longer we delay formal instruction up to certain limits, the greater the period of plasticity and the higher the ultimate level of achievement.

Summary

This study represents an evaluation of the effects of two diametrically opposed instructional strategies on inner-city kindergarten children with varying preschool experiences in a public school setting. The first approach enrichment, is child - and present - oriented. The other approach, direct instructional, is teacher - and goal - oriented.

Children were pre-post-tested on seven WPPSI subtests and the Preschool Inventory. Total scores on the Metropolitan Reading Readiness Test and school year attendance were also included in data analysis. Post-scores and attendance served as criterion variables. Other measures collected served as independent variables: poverty index, chronological age, number of siblings, ordinal rank of child in the family, and school year attendance. Two statistical tests were used: Stepdown Regression Analysis, and Analysis of Covariance. Findings were as follows:

1. Direct instructional program was significantly more effective than the enrichment approach in fostering basic skills.

2. The effect of preschool experience one year later was limited to reading skills only. Differences on other criterion measures between children representing different preschool experiences did not approach significance.

3. Children's pre-test scores were found to be the best predictors of children's post-performance on tests of general mental functioning and basic skills.

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